

of the number and beauty of the illustrations and of the prodigious amount of most useful and readable information that has been crowded into the text.

The volume contains terse descriptions of the Protozoa, Porifera, Hydrozoa, and Anthozoa. Brief though the accounts of these groups are, yet space has been found to enumerate the systematic position of each, the anatomical structure and life-history, and their economic importance where such occurs.

The authors, Prof. Jeffrey Bell and Mr. Kirkpatrick, are to be heartily congratulated on having accomplished a most difficult task in a really admirable manner. They have produced a book that should meet with a warm appreciation from those for whom it has been specially prepared.

Only an institution like the British Museum could afford to issue such a volume for the sum of *one shilling*!

Catalogue of Birds' Eggs. Vol. II. By EUGENE W. OATES.
Pp. 400; pls. xv. 1902.

WE must congratulate Mr. Oates on the completion of the second volume of this really valuable work, which commences with the Charadriiformes and concludes with the Strigiformes.

In an all-too-brief Introduction Mr. Oates tells us that the eggs of 726 species have been described, representing some 1500 specimens. The description of these eggs is published without any comment whatsoever; and though this, perhaps, in a Catalogue is all that is required, we cannot refrain from expressing a wish that Mr. Oates had given us, from his stores of knowledge, some account of the extent, trend, and probable significance of the variations presented by the eggs of the birds dealt with in this volume. With Prof. Poulton we "look forward to the time when any description of colour and marking will be considered incomplete unless supplemented by an account of their meaning and importance in the life of the species."

This volume is illustrated by fifteen beautifully coloured plates drawn by Mr. Grönvold.

Zoological Results based on Material from New Britain, New Guinea, Loyalty Islands, and elsewhere, collected during the Years 1895, 1896, and 1897 by Arthur Willey. Part VI. Cambridge, 1902. 4to.

WITH the appearance of Part VI. the long and valuable series of reports and articles published as the "Zoological Results" of Dr. Willey's South Sea travels is brought to an end. This part consists of a single work by the explorer himself under the title of "Contributions to the Natural History of the Pearly Nautilus." It is divided into two sections—a "Personal Narrative" of the voyage and a "Special Contribution" on the Nautilus.

The Personal Narrative is good reading from beginning to end,

though the style, racy and picturesque as it is in parts, is in others somewhat strained. Such efforts, for instance, as the description of the result of a blistered back as "a complete ecdysis of the dorsal integument" involve a loss of dignity to the writer. The main object of Dr. Willey's expedition was the investigation of the life-history of the Pearly Nautilus, and in pursuit of this object he took up his abode first in the Gazelle Peninsula at the eastern end of New Britain, and later in New Guinea and at Lifu in the Loyalty Islands. While in New Britain he made a journey to New Ireland and New Hanover, and he gives us some interesting remarks on the habits and customs of the natives of all these places. Scattered through the narrative are also paragraphs on several rare and important animals met with, such as *Peripatus*, *Styeloides*, *Rhodosoma*, *Astrosciera*, and *Ctenoplana*, and these notes are often highly suggestive and interesting. In speaking of the last-mentioned genus, Dr. Willey gives it as his opinion that "the tentacular plane of *Ctenoplana*, about which the aboral ciliated sensory papillæ are disposed in paired groups . . . coincides with the sagittal plane of a bilateral Turbellarian, Nemertine, or Annelid." The eggs of *Nautilus* were at length gotten at Lifu, but proved to be all unfertile. However, as they were very yolky, the value of the development of the young for information on phylogenetic points is considerably discounted.

The Special Contribution on *Nautilus* is a bulky monograph of ninety quarto pages, and discusses, in a series of sections, questions connected with almost every part of the anatomy, physiology, and natural history of the animal. There are, Dr. Willey considers, three species of *Nautilus*—*N. pompilius*, ranging from the Philippines to Fiji, *N. mucromphalus*, confined to New Caledonia, where the preceding species is never taken, and *N. umbilicatus*, taken in Papuan waters, but rare. The anatomical observations seem to have been chiefly made on the first of these species, and relate to a number of interesting points. By injecting fresh specimens information was obtained as to the distribution of the blood-vessels; and among other details it appears that the siphuncle is not, as Owen supposed, supplied by a main artery direct from the heart, but receives merely a secondary and two or three tertiary ramifications from the posterior pallial artery. The central hollow of the siphuncle is not celomic, as Haller states, but venous, belonging to the hæmocoel. There are also intra-epidermal blood-spaces in the organ, and the author thinks that these facts throw light on the function of the siphuncle, which, according to him, is a vascular appendix employed in keeping up the pressure of the gas in the chambers of the shell.

In a section on the tentacles Dr. Willey favours Owen's view of the homology of these structures with the arms of a cuttlefish, rather than that of Valenciennes that they represent suckers. The arms of Cephalopods are, he thinks, homologous with the epipodium of other mollusks and the funnel with the protopodium. The lamelligerous lobes of the infrabuccal organ of the male are,

it is suggested, homologous with the tentaculiferous lobes of the female, and not with her lamelligerous lobe, which represents the peduncle of the organ in the male. In the body of the animal two metameres are recognized—the *microbranchiate segment*, containing the smaller gill, the outer osphradium, pericardial gland, kidney, and kidney opening, with the generative opening on the right side and the opening of the pear-shaped body on the left; and the *macrobranchiate segment*, containing the greater gill and the inner osphradium, pericardial gland, kidney, and renal opening.

The *Nautilus* will eat freely any kind of animal food, is gregarious and nocturnal, a ground-feeder, and probably breeds in deep water. Captivity appears to interfere with the normal intercourse of the sexes, so that all the eggs laid in the cages in which they were kept proved unfertile. The eggs have a large brown yolk surrounded by viscid, colourless albumen, which accumulates at the poles. They are laid in ridged capsules, within which is an inner capsule.

While it is, of course, greatly to be regretted that Dr. Willey was unable to follow the development of the young of this important type, zoologists will find ample compensation for his want of success in the mass of valuable and interesting matter contained in the six volumes of this series.

On some Fossils from the Islands of Formosa and Riū-Kiū (= Loo Choo). Journal of the College of Science, Imperial University, Tokyo, Japan; Vol. XVIII. Article 6, 1902. 23 pages; 4 plates, 10½ by 7½ inches. By R. B. NEWTON and R. HOLLAND.*

THE geological fact that certain similar kinds of fossils occur at great distances apart on the Earth's surface has received the careful attention of competent naturalists, as indicating that marine conditions must have formerly extended where now either the ocean exists or both land and water constitute the surface. The occurrence of similar species at separate localities may be either in quite contemporaneous groups, or in an analogous succession of strata, not simultaneous, but homotaxial. In either case the types have been persistent, but their habitats have been disturbed by alterations of the levels of land and sea; and the earlier forms are still buried in some unworked area of the world-wide strata.

The finding of *Monotis Hawai*, of probably Permian or Permian-Triassic age (page 4), in Formosa is a striking instance of the occurrence of an isolated remnant of an ancient geological formation, like the existence in both Europe and India, and even in America, of portions of the same great formation. Strata of later date (Cretaceous and Tertiary) have been traced at intervals as still existing patches and ranges elevated above the sea-level. Thus the great Nummulitic Formation has left its western extremity recognizable as shallow-

* Equivalent to the "Loo-Choo" of modern maps. It is not spelt thus in the Monograph, but as Riū-Kiū and Riū-Kiū.